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An Enumeration of the Plants Collected by Dr. H. H. Rusby in South America, 1885-1886.—XXI.

(Continued from page 151.)

Liabum hastifolium, Poepp. & Endl. Yungas, 4,000 ft. (1742); 6,000 ft. (1743).

I brought these plants home from Kew with this name taken from Spruce's No. 4073 in the Kew Herbarium, but I now fail to find it published. They are the same as this specimen of Spruce, and related to but not identical with Mandon's No. 240 from Sorata, given in Bull. Soc. Bot. France xii. 81, as *L. corymbosum*, Sch. Bip.

LIABUM OVATUM (A. Gray). *Paranephelius ovatus*, A. Gray. Sorata, 13,000 ft. (1633). The same as Mandon's No. 239 from the same locality.

LIABUM HASTATUM (Wedd.). *Munnozia hastata*, Wedd. Chlor. And. i. 211, note. Yungas, 6,000 ft. (1744).

LIABUM RUSBYI, spec. nova. Caule folioso, pubescente, 30+ cm. alto; foliis breviter petiolatis, lanceolatis, apice basique acutis, serratis, 6-10 cm. longis, 1.5-3.5 latis, superne glabris et intense viridibus, subtus dense albo-tomentosis; capitulis corymbosis, pedunculatis, 3-4 cm. latis; involucro hemispherico, bracteis 3-5-seriatis, triangulari-lanceolatis vel ovatis, acuminatis, puberulentis ciliatisve; radiis augustis disco duplo superantibus; acheniis glabris, 1 mm. longis; pappus sordidus, rigidus 8-10 mm. longis.

Mapiri, 10,000 ft. (1745).

Erechthites valerianæfolia (Wolf), DC. Prodr. vi. 295. Mapiri, 5,000 ft. (1671).

Senecio multinervis, Sch. Bip. Bull. Soc. Bot. Fr. xii. 80, name only. Yungas, 4,000 ft. (1640); Unduavi, 8,000 ft. (2,128). The same as Mandon's 142. Schultz remarks that this is related to *S. castaneæfolius*, DC., a species which I have not seen.

Senecio clivicolus, Wedd. Chlor. And. i. 130. Near La Paz, 10,000 ft. (1679, 1681); Unduavi, 8,000 ft. (1670). The same as Mandon's 140.

Senecio volubilis, Hook. Tacna, Chili (1696).

Senecio Bridgesii, H. & A. Valparaiso, Chili (1675).

Senicio culcitoides, Sch. Bip. Bonplandia, 1856, 55, name only. Wedd. Chlor. And. i. 103. Unduavi, 8,000 ft. (1692).

Senecio formosus, H.B.K. Nov. Gen. iv. 177. Mapiri, 5,000 ft. (1672).

Senecio vulgaris, L. Sp. Pl. 1216. Near La Paz, 10,000 ft. (1674).

Senecio attenuatus, Sch. Bip. Bull. Soc. Bot. Fr. xii. 80, name only. Near La Paz, 10,000 ft. (1717). The specimens of this species were inadvertently distributed as from Tacna, Chili. Same as Mandon's 139.

Senecio attenuatus, Sch. Bip., var. MICROPHYLLUS, var. nov. Foliis spatulatis-oblongis, acutis, 4-6-dentatis, 1-1.5 cm. longis, 3-4 mm. latis. Near La Paz, 10,000 ft. (1691).

SENECIO YUNGASENSIS, sp. nov. Suffruticosus, valde ramosis, caulibus 6-8 dm. altis, puberulentis; foliis sessilibus, oblongis, apice acuminatis, basis augustis, utrinque puberulentis, denticulatis, 10-15 cm. longis, 3-5 cm. latis; capitulis radiatis, pedunculatis, numerosis, paniculatis, 1.5-2.5 cm. latis; involucro hemispherico, bracteis sub 2-seriatis, oblongo-lanceolatis, puberulentis, acutis, margine scariosis; radiis oblongis, obtusis, disco superantibus; acheniis glabris, oblongis, 1-5 mm. longis; pappus albidus, 5 mm. longus.

Yungas, 4,000 ft. (1719). Related to *S. myriocephalus*, Baker, of Brazil.

SENECIO FLOSCOSUS, sp. nov. Herbaceus, carnosus, caulibus superne tomentosus, 5-7 dm. altus; foliis utrinque glabris, petiolatis, ovato-oblongis, apice basique acutis, integris, 8-10 cm. longis, 3-4 cm. latis; capitulis numerosis, dense corymbosis, pedunculatis, radiatis, 2-3 cm. latis; involucro anguste campanulatis, bracteis sub 2-seriatis, lineari-oblongis, acutis, tomentosis, margine scariosis; radiis disco sub-duplo longior-

ibus; acheniis glabris, 2 mm. longis; pappus copiosus, albidus, 1 cm. longus.

Near La Paz, 10,000 ft. (1680); Unduavi, 8,000 ft. (1720).

SENECIO SPRUCEI, sp. nov. Fruticosus, scandens, caule parce ramoso, tomentoso, striato, 1 m.+longo; foliis petiolatis, ovatis, integris, apice acutis, basi rotundis vel truncatis, superne glabris, subtus tomentosis, 6-10 cm. longis, 3-6 cm. latis; petiolis 2 cm. longis; capitulis paucis, paniculatis, sessilibus, eradiatis, 4 mm. latis; involucro auguste campanulatis, bracteis oblongis, acutis obtusisve, glabratis, 3 mm. longis; acheniis pubescentibus, 1 mm. longis; pappus albidus, 3 mm. longis.

Yungas, 4,000 ft. (1695). The same as Spruce's No. 4811 from Tavalosus, Herb. Kew., except that that specimen has longer petioles. Related to Lechler's 2608 from Peru.

Gynoxys alternifolia, Sch. Bip. Bull. Soc. Bot. Fr. xii. 80, name only. Yungas, 4,000 ft. (1639). The same as Mandon's 131.

Gynoxys laurifolia (H.B.K.), Cass. Dict. xlviii. 435. Sorata, 10,000 ft. (1638).

Gynoxys baccharoides (H.B.K.), Cass. Dict. xlviii, 455. Unduavi, 8,000 ft. (1676). The same as Mandon's 84, called *G. Mandoni* by Schultz.

Werneria pygmæa, H. & A., Journ. Bot. iii. 348. Near La Paz, 10,000 ft. (2520).

Centaurea Militensis, L. Sp. Pl. 1297. Near Valparaiso, Chili (1554).

Barnadesia polyacantha, Wedd. Chlor. And. i. 13. Unduavi, 8,000 ft. (1552); Sorata, 10,000 ft. (1553), The same as Mandon's No. 4.

Mutisia subulata, R. & P. Syst. 193, Near Valparaiso, Chili (1548).

Mutisia viciæfolia, Cav. Ic. v. 62, t. 490. Near La Paz, 10,000 ft. (1550); Yungas, 4,000 ft. (1551).

Mutisia Bipontini, Mandon, Bull. Soc. Bot. Fr. xii. 79, name only. Yungas, 6,000 ft. (1549), The same as Mandon's No. 6.

Chuquiragua oppositifolia, Gill. et Don. Phil. Mag. 1832, 392. Near La Paz, 10,000 ft. (1555); Unduavi, 8,000 ft. (1556).

CHUQUIRAGUA FEROX (Wedd.). (*Flotowia ferox*, Wedd. Chlor. And. i. 5.) Near La Paz, 10,000 ft. (1558). The same as Mandon's No. 2.

LYCOSERIS BOLIVIANA, sp. nov. Fruticosus, ramosus, caule parce tomentoso, ramulis striatis; foliis oblongis, sessilibus, acutis vel acuminatis, denticulatis, 4-nervis, superne glabris et intense viridibus subtus parce tomentosis, 8-12 cm. longis, 2-4 cm. latis; capitulis ad apices ramorum solitaribus, 6-8 cm. latis; involucro hemispherico, bracteis sub 7-seriatis, ovatis vel lanceolatis, acutis, puberulentis; radiis brevibus, apice dentatis; acheniis oblongis, glabris, 2 mm. longis; pappus ochroleucus, glabris, 1.5 cm. longis.

Guanai, 2,000 ft. (1557). Sterile heads not seen.

Chaptalia nutans (L.), Hemsley, Bot. Biol. Centr. Amer. ii. 255. Mapiri, 5,000 ft. (1677); Yungas, 6,000 ft. (1351).

Chaptalia integrifolia (Cass.), Baker in Mart. Fl. Bras. vi. Pars. III. 378. Yungas, 6,000 ft. (1678).

Proustia pungens, Poepp. in Less. Syn. 110. Near La Paz, 10,000 ft. (2680).

Perezia multiflora (H. & B.), Less. Linnæa, 1830, 15. Unduavi, 12,000 ft. (2668).

Perezia pungens (H. & B.), Less. Linnæa, 1830, 20. Yungas, 6,000 ft. (1725). The same as Mandon's 25, regarded by Schultz as a variety.

Trixis divaricata (H.B.K.), Spreng. Syst. iii. 501. Guanai, 2,000 ft. (1699). A form similar to *T. calcarea*, Gardn.

Jungia floribunda, Less. Linnæa, 1830, 38. Yungas, 4,000 ft. (1708). A form or variety the same as Lechler's No. 2126 from Peru.

HIERACIUM MANDONI (Sch. Bip.). (*Pilosella Mandoni*, Sch. Bip. Bull. Soc. Bot. Fr. xii. 82, name only.) Sorata, 13,000 ft. (1651). The same as Mandon's 271.

HIERACIUM TRICHODONTUM (Sch. Bip.). (*Pilosella trichodonta*, Sch. Bip. Bull. Soc. Bot. Fr. xii. 82, name only.) Unduavi, 8,000 ft. (1654). The same as Mandon's 270.

Hieracium microcephalum, Sch. Bip. Bonplandia, 1856, 55. Mapiri, 10,000 ft. (1652). The same as Lechler's 1820 from Peru.

On the Casting-Off of the Tips of Branches of Certain Trees.

By Aug. F. Foerste.

(Plate CXXXII.)

The growth of the branches of trees for each year ceases at widely different periods. Some trees continue growth until they are "killed back" by the early frosts of autumn. Others develop terminal scaly buds, often quite early in spring, and thus have the extent of their growth determined long before extraneous causes tend to check their development. The time at which terminal buds are formed varies widely in different species, but it is well known that before the end of May most trees have terminated the yearly growth of their branches in this way. A small percentage of our trees have, however, developed the curious habit of securing determinate growth, by casting off the tips of their branches at well formed joints. The scars left at these joints are usually smooth, and may readily be distinguished from leaf-scars by the fact that the fibro-vascular tissues do not form bundles, and appear as little protuberances in the scar, as is the case with most leaf-scars. Instead, the fibro-vascular tissues form a more or less circular figure, following the outline of the scar, as might be expected, since they represent the fibro-vascular tissues between the wood-layers and the bark proper. In *Catalpa speciosa*, Warder, this terminal scar may be seen on the lower sides of the branches (Fig. 2). The leaf-scars and the corresponding leaves are usually smaller here than on the upper side of the branch (Fig. 1) on the more mature twigs, although the leaves of each whorl are all similar during their early history. *Staphylea trifolia*, Linn. shows a terminal scar (Fig. 3), in some cases almost hidden between the two upper lateral buds. *Ailanthus glandulosus*, Desf. also has a terminal scar (Fig. 5). All the branches of the same tree do not cast off their tips, even in cases where part of the branches may almost invariably be expected to have done so. This is well shown by various species of *Æsculus* for instance, *Æsculus Hippocastanum*, Linn., where a part of the tips have been cast off, leaving exceedingly well-marked and evident terminal scars (Fig. 4), whereas almost all twigs of less vigorous growth, and some of

those most normal in type, have become determinate in the usual way by means of terminal scaly buds. Certain species of trees, however, show a remarkable uniformity regarding the casting off of the tips of all their branches. Thus in case of *Tilia platyphyllos*, Scop., it was necessary to search for several hours during the last days of May, in order to secure the few specimens from which Fig. 7 was prepared, and all of these showed that another week would have witnessed the casting off also of these remaining tips (at *a* in the figure). Our American linden, *Tilia Americana*, Linn., also shows terminal scars (Fig. 6). It must not be supposed however, that all the tips of branches thus cast off are in as advanced a stage of development as those figured in the case of the European linden. Thus in the case of a European species of elm, the cast-off tips were small, none of the internodes of these tips being more than a few millimeters in length. A terminal scar is also shown by *Ulmus Americana*, Linn. (Fig. 8).

Of course the time at which the casting off of the tips takes place varies widely in different species. Thus during the last week of May it was found impossible to find tips of branches in the case of *Æsculus Hippocastanum* which had not been cast off, where such an operation was at all probable. All remaining branches had terminal scaly buds already formed. *Tilia platyphyllos* had also already cast off its tips, but three or four were still found in situ, although the plane of separation or joint had already been formed. *Ulmus campestris*, Linn., on the other hand, had lost only a third of its tips, although the plane of separation was becoming evident in the remainder. *Catalpa speciosa* had not yet reached a sufficiently advanced growth of its branches to give any indication of the future separation of its tips.

It may be of interest in this connection to mention that quite a number of trees and shrubs do not cast off their tips, nor form terminal scaly buds, nor are they "killed back" by frosts, but the tips of the branches simply wither and remain attached to the stem. *Diospyros Virginiana*, Linn., has been figured as a case of such a plant (Fig. 9). In certain shrubs this withering takes place in spring.

The casting off of the tips of branches may be looked upon as simply another solution of the problem how to secure determin-

ate growth of branches, and thus obviate the useless expenditure of energy displayed by trees whose branches are always killed back by winter frosts. All the time which elapses between the formation of terminal scaly buds, or the casting off of the tips of branches, and the first frosts of autumn, may be looked upon as a period of preparation for the few weeks of active growth of the next season.

The Hepaticæ of Labrador.

By LUCIEN M. UNDERWOOD.

During the past three years Rev. Arthur E. Waghorne, of Newfoundland, has been sending large numbers of packets of Newfoundland Hepaticæ for examination, and has made a large number of additions to the only published list* from that province. The examination of this series had been interrupted, and a full report of the Newfoundland species cannot yet be given; this will follow later.

During August of last year (1891) Mr. Waghorne took a short trip to the coast of Labrador, and as one of the results has sent over a hundred packets of liverworts for determination. With the exception of a few species from this coast sent me by Mr. O. D. Allen in 1887, these are the only ones yet reported from that region. While the list contains mostly species that would be expected from this locality, one or two species are of interest as having no definite location to which they could be assigned. This is particularly true of *Harpanthus Flotovianus*, which was described in the revised Manual as "certainly extra-limital" without my knowledge or approval. I have reason to believe it will be found in our Northern States, particularly in mountain regions.

I append the list as follows:

JUNGERMANIACEÆ.

1. *Blepharostoma trichophyllum* (L.), Dumort.
2. *Cephalozia bicuspidata* (L.), Dumort.
3. *Cephalozia divaricata* (Sm.), Dumort.
4. *Cephalozia fluitans* (Nees), Spruce.

* Flora Miquelonensis, 1888.

5. *Cephalozia multiflora*, Spruce.
6. *Chiloscyphus polyanthos* (L.), Corda.
7. *Diplophyllum taxifolium* (Wahlenb.), Dumort.
8. *Gymnomitrium concinnatum* (Lightf.), Corda.
9. *Harpanthus Flotovianus*, Nees.
10. *Harpanthus scutatus* (Web.), Spruce.
11. *Jungermania attenuata* (Mart.), Lindenb.
12. *Jungermania barbata*, Schreb.
13. *Jungermania cordifolia*, Hook.
14. *Jungermania excisa*, Dicks.
15. *Jungermania inflata*, Huds.
16. *Jungermania lycopodioides*, Wallr.
17. *Jungermania minuta*, Crantz.
18. *Jungermania quinquedentata*, Thed.
19. *Jungermania setiformis*, Ehrh.
20. *Jungermania sphærocarpa*, Hook.
21. *Jungermania ventricosa*, Dicks.
22. *Kantia trichomanis* (Dicks.), S. F. Gray.
23. *Liochlæna lanceolata* (L.), Nees.
24. *Marsupella emarginata* (Ehrh.), Dumort.
25. *Mylia Taylori* (Hook.), S. F. Gray.
26. *Pellia epiphylla* (L.), Corda.
27. *Pellia endiviæfolia* (Dicks.), Dumort.
28. *Ptilidium ciliare* (L.), Nees.
29. *Plagiochila interrupta* (Nees.), Dumort.
30. *Scapania undulata* (L.), Dumort.

MARCHANTIACEÆ.

31. *Marchantia polymorpha*, L.

Of the above species all except Nos. 8, 9, 13, 16, 19, 20 and 26 are more or less common species of New England. Nos. 8 and 20 are found in our higher mountain regions. Twenty-two are among the sixty-one species known from Greenland,* the numbers not yet reported from that more northern province being 4, 5, 10, 12, 14, 20, 25, 26 and 27. All are common European species, and two-thirds are also reported from Asiatic Russia.

MAY 25, 1892.

* Joh. Lange: Meddelelser om Gronland. Tredie Hefte 407-421 (1887).

An Extract from the Diary of Prof. J. W. Bailey.*

WEST POINT, May 21st, 1835.

Be this day ever remembered! for on it I first became acquainted with a scientific botanist, and he, too, the first in America; in short no less a person than the distinguished Dr. John Torrey, of New York. I was introduced to him at the hotel by Lieut. Mather. I was much surprised to find him so young a man. After conversing awhile he proposed a botanical excursion, and we proceeded down the hill behind the hotel, collecting *Corydalis aurea*, *Cardamine Virginica*, *Celtis occidentalis*, etc.; we were, however, soon driven in by the rain. We adjourned to my room, where we held a conversation on botany, which to me was highly interesting. He says that the plant called *Gaultheria hispida* is no *Gaultheria*, but a new genus having the fruit of an *Oxycoccus* and flower of *Vaccinium*. (This refers to *Chiogenes hispidula*, T. & G. It was called *Gaultheria hispidula* by Muhl., W. W. B.) He mentioned some anecdotes of Prof. Lindley; among others, the fact that the "Outline of the First Principles of Botany" was wholly written on his journey to and from his residence, about six miles from London. When the stage stopped at an inn, Lindley would write on a scrap of paper a sentence or two of the work, using his hat as a desk. This was but one instance of the constant devotion and industry of the professor.

MAY 22d, 1835.—This day being very fine, Dr. Torrey and myself made a short botanical excursion among the rocks (from the hotel around to Kosciusko's Garden). He pointed out the *Lycopodium* . (In a note after *Lycopodium rupestre* in my father's copy of Bigelow's "Plants of Boston," he says: "West Point, May 22d, 1835, pointed out to me by Dr. Torrey." This fixes the plant as *Selaginella rupestris*, Spring., W. W. B.) I had not noticed it before. He also stated that he had found *Taxus* somewhere near Gee's Point. (The extreme or lighthouse end of West Point, W. W. B.) He related to me a curious and dangerous adventure that once happened to him. In company with a friend of his, during one of his journeys, he had attempted to follow a mountain path which had not been travelled upon since

* Communicated by Prof. W. W. Bailey.

the spring freshets, and which had become covered with loose pebbles. He soon lost the path and suddenly found himself slipping. He called to his friend, who was in the same predicament, and advised him to lie down and attempt to stop himself with his extended hands and feet. They both lay down, but still found that they were slowly sliding. Torrey was ahead and could not stop himself till he reached the brink of a precipice of three hundred feet descent. Here he stopped, but the slightest movement would have caused him to go over. His friend had, by means of a knife, obtained a foot-hold, and was able to retain his position. Torrey asked him if he could possibly assist him, for he, Torrey, feared that he would soon slip. His friend replied that he could not leave his position to assist him, but if Torrey could give him anything to take hold of he might perhaps pull him up. Torrey took his handkerchief, wound it round his hand, and let the wind blow the end to his friend who caught it, and thus rescued the doctor from his perilous situation. They then, by means, I presume, of their knife (although the doctor did not explain this) succeeded in clambering up to a safe place. At the time the doctor thought of using his handkerchief his feet were actually hanging over the precipice, and so hazardous was his position that he did not dare raise his arm to reach his friend.

The doctor mentioned some curious observations which he had made upon the *Campanula rotundifolia*. He had noticed that the plant bears in the early part of the season apetalous flowers often with tri-sepalous calyx, which he had carefully examined without perceiving any trace of stamens or pistils; yet, strange to say, these flowers perfected seed as in the usual flowers. He knew, however, that stamens and pistils in some form or other must be present, and, accordingly, on careful examination with a microscope he found the base of the interior of the flower was divided into five distinct divisions, and he soon found that the apparent base was really a membrane composed of five scales, under which the stamens and pistils were concealed. The doctor left in the steamboat for New York. His address is 30 McDougal Street.

Botanical Notes.

Monarda Clinopodia, L.—After many examinations based upon the growing plant, I am constrained to believe that *Monarda Clinopodia*, L., should be considered a variety of *Monarda fistulosa*, L. There is a marked difference in appearance between *M. Clinopodia* and typical *M. fistulosa*, but I think it occasioned solely by place of growth. Typical *M. fistulosa* is a lover of sunshine, preferring open, dry soil, and when growing in woods I have invariably found it where sunshine had access, while I have always found *M. Clinopodia* in the immediate vicinity of shady springs, it preferring moisture and shade. I have found the latter in locations of this kind, and a few rods distant away from the influence of shade would be its relative, *M. fistulosa*, in abundance. The difference in appearance is difficult to embody in language. It can be said that in *M. Clinopodia* the stem is more sharply angled, leaves broader and thinner, throat of calyx less bearded and corolla lighter in color than *M. fistulosa*, but is this sufficient for the limitation of a species? Such differences might justify varieties, but hardly species. It is well known that *M. fistulosa* is extremely variable, and I have collected specimens that clearly bridge over any of the differences between it and *M. Clinopodia*. FRANK E. MCDONALD.

Nomenclator Bryologicus. General Paris. (Rev. Bryol. xix., 41.) An appeal is made to all bryologists to send the author reprints or copies of descriptions of all new species of mosses that have been published since the issue of the last edition of Schimper's Synopsis Muscorum, and Müller's. A list of works consulted is given, and all omissions will be gratefully acknowledged. It is proposed to follow the plan of Steudel's Nomenclator, but on a more extensive scale, giving the synonymy more fully. Such a work is greatly needed. E. G. B.

Index to Recent Literature Relating to American Botany.

Bahama Islands—A Winter Visit to the. H. W. Wilson. (Trans. Mass. Hort. Soc. part i. 210, 1891; illustrated).

Bartram's Oak. A. Commons. (Bot. Gaz. xvii. 125, 126).

In this most recent contribution to the question of the status

of this tree the author considers it as a variety of *Quercus imbricaria*. Without contributing any new facts to the argument, the opinion is expressed " that further investigation will confirm the conclusion here reached." Unfortunately, the geographical range of this species is such as almost to preclude the possibility of any connection between it and *heterophylla*, at least the distribution of the two trees is such that almost any other likely hypothesis ought to be considered before adopting this one which appeals so strongly to the improbable. The author mentions a tree found by him in Salem Co, New Jersey, which he refers to an entire leaved form of *heterophylla* (*imbricaria ?*). The specimens of this tree in the Herbarium of Columbia College are manifestly not *imbricaria* but *Rudkini*, as first determined by Dr. N. L. Britton when submitted to him. So far as can be ascertained no *imbricaria* occurs north of Delaware, but *heterophylla* is found as far north as Staten Island, New York. If it is to be regarded as a variety its invariable connection with *Phellos* is too significant to be ignored, but all facts and observations seem to point irresistibly to the conclusion that we must consider *heterophylla* as a hybrid, with *Phellos* as one of its parents. A. H.

Botanical Names of the U. S. Pharmacopœia. (Bull. Pharm. Reprint, pp. 20).

This is an important paper presented at the recent meeting of the American Pharmaceutical Congress. Dr. Rusby has given very close study to the names associated with drug-plants in the last edition of the " Pharmacopœia," and finds that a number of them will have to be changed in the new edition now in preparation, in order to make them intelligible to botanists and pharmacists as well. He gives a list of all the drugs, arranged alphabetically, with the proper botanical names and their dates, so far as he has had opportunity to ascertain them, together with their synonymy, and proposes to continue his investigations until they are all accurately determined—a task of no small magnitude, but for which he will have the cordial thanks of all interested.

Breves apuntes sobre la Pingüica. Sr. Murello. (El Estudio iv. 234).

Description, illustration and notes on the properties of *Arctostaphylos pungens*, locally known in Mexico by the name of " Pingüica."

Catalogue of Canadian Plants, Part VI.—Musci. John Macoun. (Geol. and Nat. Hist. Survey of Canada. Montreal, 1892. 295 pp. Octavo. price 25 cents).

Since 1861 Prof. Macoun has been collecting the material on which this catalogue is based, having had the help of Sullivant, Austin, James, and, more recently, of N. C. Kindberg, C. Muller and Warnstorf in the determinations.

It includes all the British territory north of our boundary, and Greenland, Alaska and the Pribiloff Islands. Nine hundred and fifty-three species are listed, and two hundred and thirty-seven of these are new or recently described by Kindberg and Muller, which, with fifty-three new varieties, bring the average to over twenty-five per cent. hitherto unknown. Unfortunately, fifty-eight of these are described from barren specimens, and in many cases the descriptions are so incomplete that it will be very difficult to determine just what value they will have in future study. There is no doubt that such a series of specimens as Prof. Macoun has collected and distributed in his "Canadian Mosses" will do much toward a better knowledge of that hitherto bryologically undiscovered country west of Ontario, from which most of the new species come, only forty-seven belonging to the provinces of Ontario, Quebec and Newfoundland. Twenty-five European species, new to America, are added, and two substitutions are made—*Mnium pseudolycopodioides* for *M. lycopodioides*, and *Hylocomium Pyrenaicum* for *H. Oakesii*. Of the fifty-three varieties, most of the eastern ones are of doubtful importance, as they are founded on slight characters of very common and variable species. Six genera, not hitherto reported from North America, are included—*Monogranum* with one species, *M. stenodictyon*, *Leptodontium* with one species, *L. Canadense*, which on comparison with Austin's type of *Pottia riparia* proves to be that species, which, however, is undoubtedly a *Leptodontium*, replacing *L. Canadense* by *L. riparium* (Aust.). Under *Leptobarbula berica*, also new to America, there is a mistaken citation to L. & J. Mauual, p. 106. It is a synonym of *Trichostomum tenue*, Br. & Sch., not Hedw. *Zygodon* with one species is also added, *Z. viridissimus*. *Merceya latifolia* and *Lescuræa imperfecta* are both Western. Of the species retracted, *Hylocomium Flemmingii*, Austin, and *Alsia*

Macounii, Kindberg, may be noted. *Orthotrichum lonchothecium* also should be, for it is antedated by *O. stenocarpum*, Venturi.

Many changes from the distributed names of the Canadian Mosses have been made. Those who have not mounted their specimens are better off than those who have. The most serious criticisms which can be made of Prof. Kindberg's work are these: A too evident desire to name new species without sufficient comparison with American material, though some good work has been done by careful comparison with European specimens; second, unsystematic, and often meager descriptions, too frequently from sterile specimens; third, a lax system of nomenclature by which species and varieties previously described and published, or distributed, are given new names. Examples of this will be found on the species numbered 199, 245, 259, 284, 296, 749, 799, 811, 818 and 939. We hope, as our Western mosses come to be studied, that Prof. Macoun will continue the same generous policy that he has with our Eastern ones, and give students the benefit of comparison with the fine collections which he has gathered together for the "Geological and Natural History Survey of Canada." E. G. B.

Compositæ—Studies in the—I. Edward L. Greene. (Pittonia ii. 244-248).

It is pointed out that the name *Blepharipappus*, Hook. (1833), antedates *Layia*, H. & A. (1841), and the species included by Dr. Gray in *Layia* are transferred to the older genus; *Ptilonella*, Nutt., based on *Blepharipappus scaber*, Benth., is maintained as a genus. *Ereminula* is the generic name proposed for *Dimeresia*, A. Gray (1866), Prof. Greene regarding *Dimeresa*, Labill. (1824), as the same word as *Dimeresia*.

Continuity of Protoplasm through the Cell-Walls of Plants. W. J. Beal and J. W. Toumey. (Amer. Month. Micros. Journ. xiii. 129-132, illustrated).

Cultivated Native Plums and Cherries. L. H. Bailey. (Bull. 38, Cornell Univ. Agric. Exper. Sta. pp. 73, illustrated).

Professor Bailey maintains that there are two, and perhaps three, species included in the description of *P. pumila* in recent text-books. *P. pumila*, L., he regards as of northern distribution, growing on sandy and rocky shores, and characterizes it as a

prostrate or decumbent shrub with linear or oblanceolate leaves. *P. cuneata*, Raf., is the name taken up for the other species, described as erect or even strict in habit, with obovate few-toothed leaves, and grows in mountainous regions in the East. The third dwarf cherry inhabits the eastern Rocky Mountains and Great Plains; it is prostrate in habit and has shorter leaves than *P. pumila*, of which the author is inclined to regard it a variety. All the other species, which are in cultivation for their fruits, are alluded to or described. *P. nigra*, Ait., separated from *P. Americana*, Marsh, by Prof. Sargent, is not regarded as distinct from that species, although Prof. Bailey appears to be somewhat uncertain of his decision in this case. N. L. B.

Descriptiones Plantarum nonnularum Horti Imperialis Botanico Petropolitani in Statu vivo examinatum. E. Regel. (Acta Hort. Petrop. xi. 299-314).

The following new species are of American derivation: *Agave Maximowicziana*, *Epidendrum pugioniforme*, *Masdevallia biflora*, *M. macrochila*, *M. Muelleri*, *Miltonia flavescens*, *Waluewa pulchella*, *Solanum Dammianum* and *Claviga cauliflora*.

Development of the Ovule in Grindelia squarrosa. H. W. Norris. (Am. Nat. xxvi. 704, illustrated).

Diseases of Trees likely to Follow Mechanical Injuries. W. G. Farlow. (Trans. Mass. Hort. Soc. part i. 140, 1891).

Elementary Botanical Exercises. Charles E. Bessey. (J. H. Miller, Publisher, Lincoln, Nebraska, 1892).

A series of thirteen short chapters outlining studies in the various forms of plant-life for beginners.

Erstes Verzeichniss der von E. Ule in den Jahren 1883-87 *in Brasilien gesammelten Pilze.* O. Pazschke. (Hedwigia xxxi. 93).

Two hundred and one species are listed, among which the following are described as new: *Urocystis Oxalidis*, *Æcidium Uleanum*, *Rostrupia Scleriæ*, *Lachnocladium Ulei*, *Asterina Brasiliensis*, *A. flexuosa*, *A. laxa*, *A. paraphysata*, *A. stricta*, *A. Uleana*, *A. Winterana*, *Meliola crenata*, *M. denticulata*, *M. tortuosa* and *M. Uleana*.

Ferns—Synoptical List of—IX. G. S. Jenman. (Bull. Bot. Depart. Jamaica, No. 32, 7, 1892).

A key to 18 species of *Adiantum*, with notes on *A. deltoideum*, *A. lucidum*, *A. Wilsoni* and *A. macrophyllum*.

Flax Culture for Fiber in the United States—A Report on. Charles Richards Dodge. (Washington, 1892; illustrated).

Geographical Distribution of Plants—The. W. F. Ganong. (Trans. Mass. Hort. Soc. part i, 140, 1891).

Labiatæ—On Certain Californian. Edward L. Greene. (Pittonia, ii, 233-236).

Audibertia polystachya, Benth. is erected into a new genus, *Ramona*, and the other Californian species placed in *Audibertia* by Bentham and A. Gray, are referred to *Salvia*.

Légumineuses de l'Ecuador et de la Nouvelle-Grenade de la collection de M. Ed. André. M. Micheli. (Jour. de Bot, vi, 117-124; 141-147; 187-193; 197-206).

An annotated list of the Leguminosæ collected by M. Andre in western equatorial South America in 1875 and 1876. *Mucuna Andreana*, *Calopogonium racemosum*, *Galactia rotundifolia* and *Cæsalpinia Andreana* are described as new.

Moss—A New Californian. N. C. Kindberg. (Pittonia ii, 243).

Description of *Camptothecium alsioides*, collected by Mr. Howe in Marin Co.

Native Orchids. Francis Wilson. (Am. Gard. xiii. 466). With illustrations of *Spiranthes simplex*, *S. gracilis* and *S. cernua*.

Notes on the Hardwood Trees of Illinois. J. Schneck. (Hardwood ii, No. i).

Pentstemons—Remarks on Certain. Edward L. Greene. Pittonia ii, 237-243).

Chelone nemorosa, Dougl. (*Pentstemon nemorosus*, Trauttv.) is maintained as a *Pentstemon* and the species of the group of *P. fruticosus* (Pursh.),=*P. Lewisii*, Benth., are discussed. *P. montanus* being a new species from the Yellowstone Park (Tweedy, n. 866) and *P. Davidsoni* a new species from California.

Phenomena and Development of Fecundation. H. J. Webber. (Am. Nat. xxvi, pp. 103-111, 287-310, plates xi-xiv).

The processes of reproduction are reviewed and compared in both animals and plants, in the latter being illustrated by drawings of *Caulerpa*, *Iris*, *Acetabularia*, *Ulothrix*, *Ectocarpus*, *Cutleria*, *Fucus*, *Dudresnaya*, *Glœosiphonia*, *Monotropa*, *Yucca*, *Lilium* and *Peronospora*.

Plant Diseases in West Virginia. C. F. Millspaugh. (Gard. and For. v. 346).

Portland Catalogue of Maine Plants—Second Edition. Merritt L. Fernald. (Proc. Portl. Soc. Nat. Hist. 1892, 41-72; reprint.

Since the issue in 1868 of the first "Portland Catalogue," compiled by Prof. Goodale and Rev. Jos. Blake, no complete account has been published of the plants recorded as occurring naturally in the State of Maine. The original Portland Catalogue is very rare, and the present one will be gladly received. During the interval since 1868 over 450 species and varieties of flowering plants and vascular cryptogams have been added, the present list enumerating over 1550. The work is a mere list, but the general distribution of most of the commoner plants is indicated by symbols. It is capitally printed, there being very few typographical errors. Acknowledgment is specifically made for aid received from several collectors and some seventy others are stated to have furnished material. An interesting omission which we note is *Littorella lacustris*, sent us in 1891 by Prof. F. L. Harvey, from Orono. *Lechea intermedia*, Leggett, is pretty certainly common in the State, while *L. minor*, at least the plant described under that name in Gray's Manual, is not known to occur there. For nomenclature the author has naturally followed the sixth edition of that manual. N. L. B.

Primitiæ Floræ Costaricensis. (Bull. Soc. Bot. Belg. xxx, 196-305).

This comprises—I. Piperaceæ, by M. C. DeCandolle, who describes twenty-four species of *Piper*, and ten of *Peperomia* as new, besides numerous varieties. II. Labiateæ, by M. J. Briquet, giving descriptions of new species of *Salvia* and *Stachys*. III. Melastomaceæ, by M. A. Cogniaux, in which new species of *Tibouchina*, *Monochætum*, *Axinæa*, *Leandra*, *Conostegia*, *Miconia*, *Clidemia*, *Bellucia*, *Ossæa*, *Blakea* and *Topobea* are characterized. IV. Cucurbitaceæ, by M. Cogniaux, with descriptions of novelties in the genera *Pittiera* (new genus), *Cyclanthera*, *Elaterium* and *Sicyos*. V. Araliaceæ, by M. E. Marchal, with *Didymopanax Pittieri*, n. s.p. VI. Leguminosæ, by M. M. Micheli, with new species in *Cracca*, *Mucuna* and *Mimosa*. VII. Poly-

galaceæ, by M. R. Chodat, with new species in *Polygala* and *Monnina*.

Sarracenia flava. (Meehan's Monthly, ii, 113; illustrated.)

Second Edition of Webber's Appendix to the Catalogue of the Flora of Nebraska, with a Supplementary List of Recently Reported Species. Charles E. Bessey. (Contrib. Bot. Dept. Univ. Neb. N. S. iii, p. 55).

This consists of Mr. Webber's paper, printed in Part I. of the 6th volume of the Transactions of the St. Louis Academy, to which Dr. Bessey now adds 170 species and varieties, 77 of them Phanerogamia, together with some revisions of former determinations. One of the most interesting plants recorded is *Clematis Douglassi*, var. *Scottii* (Porter), found by Prof. Swezey in Sheridan County, which we take to be a perfectly valid species, being strengthened in this view by the similar attitude of O. Kuntze (Verhand. Bot. Verein, Brandenburg, xxvi, 179), who would doubtless have made it a variety, sub-species, sub-variety, or sub-sub-variety, if there had been any chance of so doing.

N. L. B.

Silva of North America, Volume IV—Rosaceæ—Saxifragaceæ. C. S. Sargent. (4to, pp. 141, plates cxlviii-cxcvii).

This volume contains figures and descriptions of the following species: *Chrysobalanus Icaco, Prunus nigra, P. Americana, P. hortulana, P. angustifolia, P. Alleghaniensis, P. subcordata, P. umbellata, P. Pennsylvanica, P. emarginata, P. Virginiana, P. serotina, P. Caroliniana, P. sphærocarpa, P. ilicifolia, Vauquelinia Californica, Cercocarpus ledifolius, C. parvifolius, Pyrus coronaria, P. angustifolia, P. rivularis, P. Americana, P. sambucifolia, Cratægus Douglasii, C. brachyacantha, C. Crus Galli, C. coccinea, C. mollis, C. tomentosa, C. punctata, C. spathulata, C. cordata, C. viridus, C. apiifolia, C. flava, C. uniflora, C. æstivalis, Heteromeles arbutifolia, Amelanchier Canadensis, A. alnifolia* and *Lyonothamnus floribundus*, besides several regarded as varieties by the author. The volume maintains the superior character in text and illustrations of its predecessors. Hardly a slip in typography or anything else in the make-up of the work is discernible. We note one error on page 132, where *Amelanchier alnifolia* is said to range "from the valley of the Yukon,

southward through the ranges of *Northeastern* America, etc." while *Northwestern* America must be intended, there being no evidence, we believe, of the occurrence of this species east of Michigan and Ohio. N. L. B.

Sinonimia Vulgar y Cientifica de Varias de las "Plantas de la Nueva España," de M. Sessé y José Mociño. José Ramérez. (El. Estudio iv. 220).

Tsuga Pattoniana. (Gard. Chron. xii. 10). With illustrations of *Tsuga Pattoniana* and *T. Mertensiana.*

Umbellularia. (Gar. and For. v. 349). With illustration of *Umbellularia Californica.*

Proceedings of the Botanical Club of the Forty-first Meeting of the A. A. A. S., Rochester, N. Y., August 18–24, 1892.

THURSDAY, AUGUST 18TH.

The meetings of the Club were held in the main building of Rochester University, in which were carried on the sessions of the American Association.

Owing to the unavoidable absence of both President and Vice-President, the opening session of the Club at 9 A.M. was called to order by its Secretary.

Dr. H. H. Rusby was chosen to fill the vacancy of the President's chair, and Dr. W. P. Wilson that of Vice-President.

To save time, the reading of the minutes was dispensed with. The Treasurer's report was accepted, and a voluntary contribution amounting to $4.56 was taken up to defray the expenses of the Secretary's office. The Committee on Nominations to nominate officers for the ensuing year was appointed by the Chair, and consisted of the following members: Arthur Hollick, C. R. Barnes and F. V. Coville. The Local Committee reported upon the proposed excursion of the Club to the lake shore, and the matter was referred by the Club to the President and Secretary.

Under the head of new business, Dr. N. L. Britton presented the following resolution, the outcome of a preliminary meeting of those especially interested in questions of nomenclature, held the night previous:

In view of the great desirability of establishing a stable sys-

tem of botanical nomenclature in North America, I move the appointment of a committee of seven members of the Club, of which the President shall be one, to consider the questions involved, and to submit a set of recommendations to the Club before the close of the present session.

The resolution was adopted and the President appointed the following members to serve on this committee: H. H. Rusby, N. L. Britton, J. M. Coulter, F. V. Coville, L. M. Underwood, L. F. Ward and W. A. Kellerman.

The first paper on the programme, by Dr. Britton, "Some Nomenclatorial Problems," was, upon the request of the author, omitted, in view of the previous conference and appointment of a committee to consider the matter.

The papers presented, together with brief abstracts, are given in sequence of delivery as follows except in cases noted, where they are to be published subsequently in full. So far as possible, the discussion following each paper has been added to the abstract.

1. "The use of the terms Range, Locality, Station and Habitat," by F. V. Coville.

Mr. Coville suggested the following definitions:

Range.—The region over which a type naturally grows.

Locality.—The more or less general geographic position of one or more individuals of a type.

Station.—The precise spot upon which a type occurs or an individual was collected.

Habitat.—The kind of place in which a type or individual occurs.

This paper was discussed by Dr. Britton, who pointed out the need of more such papers to restrict definitely the meanings of terms in common use among botanists; Dr. Barnes, who objected to the third clause on the ground that it was impossible to define the precise spot upon which a type occurs; Mr. Seaman, who protested against the use of the word *type*, and suggested the substitution of the word species; Mr. Fernow, who agreed with Mr. Seaman in objection to the word type, and suggested under the definition of the term station the phrase "precise spot upon which the indi-

vidual occurs," for "precise spot upon which the individual was collected."

On motion of Dr. Britton, a committee consisting of Messrs. Coville, Beal and Fernow was appointed to discuss the matters brought up by the paper, and report before the close of the session.

2. "Travels in Paraguay and its Flora," by Thomas Morong.

The speaker gave a brief account of his two years' experience in Paraguay, stating that a complete account of the botanical results of his trip would soon be published.

Dr. Rusby called the attention of the Club to the dangers that had surrounded Dr. Morong in his travels.

3. "A variety of *Polypodium vulgare*, L., new to America," by L. M. Underwood.

In the autumn of 1890 my attention was called to a peculiar "crispy" fern, growing on Mohawk Mountain, Connecticut, by Mrs. T. R. Waite, of New Haven, who had spent several summers on the summit of the mountain in the log cabin established there for tourists. The plant proved to be a variety of *Polypodium vulgare* hitherto unknown in this country, but described from England as var. *Cambricum*. The plant is easily recognized by its deeply pinnatifid pinnæ, which are strongly in contrast with the normal entire pinnæ of typical forms of the species. This discovery is rendered more interesting by the announcement of the "State Botanist" of New York* of a second European variety of this same species. Unlike var. *cristatum*, as figured by Peck and shown in the specimens kindly communicated by him, the specimens of var. *Cambricum*, as found on Mohawk Mountain in August, 1890, and again in July, 1891, were entirely sterile, not even showing rudimentary sori. The plants were growing on the sloping face of the granitic rock of which the mountain is composed, in small patches thoroughly entangled with plants of normal *Polypodium vulgare*. Environment is, therefore, not the cause of the variation in this instance, but it must be attributed rather to an inherent tendency to be something different. It is a question of interest to know just when to recognize a form of this kind as a true botanical variety.

* XLIV Reg. Report, plate I.

In addition to the paper printed in full above, the author showed specimens of *Onoclea sensibilis*, var. *obtusilobata*, illustrating a peculiar adaptation in the fertile fronds that succeed, in time of appearance, sterile fronds that have been cut or injured. These fertile fronds show a development of foliar surface abnormal to fronds of uninjured plants, and open out upon first arising from the root-stock, evidently to supply chlorophyll bearing tissue to perform the necessary work of assimilation. The paper was discussed by M. B. Waite, who inquired if the peculiar variety of *Polypodium vulgare* might not be a hybrid. The author thought not, as he had found all gradations of variation from the typical *P. vulgare*.

The afternoon session was opened by the report of the Committee on an Excursion to the shore of Lake Ontario. The committee decided it impracticable to accept the invitation of the local committee.

The following papers were presented:

4. "Symbiotic Growths in the Roots of Ranunculaceæ," by F. B. Maxwell (presented by W. R. Dudley).

This was a preliminary paper on the occurrence of fungal hyphæ in the cortex of the roots of dry land species of *Ranunculus*, *Anemone*, *Clematis* and other genera.

Discussion was opened by Dr. Beal, who inquired if the mycelium of the fungus was found at or near the tip of the growing roots of the plants; to which the author replied that these fungal hyphæ were found within one to two centimetres of the root-tip. Prof. Kellerman asked if any exterior signs of the presence of fungus could be seen; to which Maxwell replied that to all external appearances the roots were perfectly healthy and normal in all respects. Prof. Dudley mentioned the fact that work upon the fungus had been secondary to a study of the anatomy of the roots, and had been suggested by the presence of similar fungous bodies in the roots of Orchidaceæ, and expressed the opinion that these fungi, growing in symbiotic relations with the roots of plants, might be much more frequent than had been supposed. Dr. Rusby inquired if all plants of a species were attacked alike, to which the author replied in the negative. Dr. Britton brought out the fact that all, or nearly all, roots of a single plant were

likely to contain the fungus; Dr. Beal, that no difference between plants with these fungi and those without was observable above ground.

5. "Some Rare and Interesting Fungi from Florida," by W. T. Swingle.

In this note the author called attention to, and showed specimens of, four little-known fungi from Florida. The first an Ascomycete, new to America, and also on a new host, resembles, in a slight degree, *Claviceps*, but differs from this fungus in many respects. The parasite attacks the inflorescence of *Cenchrus echinatus* while it is young, and transforms it into a black, shining sclerotium from two to three inches long. These sclerotia produce the first year spermagonia as pustular bodies partially imbedded in the substance of the sclerotium, and later, after one year at least, the ascigerous form, which consists of a globular head supported on a long, slender stipe. The asci are embedded in cavities in this head. The fungus has been named by Fries, *Ephelis*, from the sclerotial and spermagonial stage, and by Speggazzini as *Balansia*, from the ascigerous form. It has also been described by Cooke & Massee in Annals of Botany. Unlike ordinary *Claviceps*, the tissue of the host plant is included within the substance of the sclerotium. He noted, on authority of Prof. Rolfs, that the veterinarian of the Florida Experiment Station is at work upon the question whether these sclerotia produce a disease similar to ergotism, and thought that its destructive action upon the terrible sand-burr would be worth looking into.

The second fungus was a species, probably new, of *Cæoma*, attacking the cones of *Pinus palustris* and *P. Cubensis*. When attacked, the cones become broader and stouter than the healthy ones, and assume a chocolate-brown exterior. The exterior layer upon breaking away, as it sometimes does in a single night, reveals the immense sorus of chrome-yellow spores, which renders the cone conspicuous for at least one-eighth of a mile.

The third interesting species, found upon the leaves of the sour orange in the hummock land of Florida, appears as a whitish or gray strand, which ascends the young branch, and on reaching the leaf spreads itself out on the upper surface in a thin, whitish layer, and causes a wilting and final death of the leaf. From the

habit of spore production, the author thinks it may be related to the *Thelephoriaceæ*.

The author finally exhibited a disease of pear trees and fruit, which resembled that of the orange previously spoken of, which was called to his attention by Prof. Rolfs. It differs from the orange disease in its mode of spore formation, and in the color of the strands which are found on the twigs and fruit. Discussed by Kellerman, who inquired as to the time of fruiting of the ascigerous form of the fungus on *Cenchrus*, bringing out the fact that this form was mature only after the first year, as in *Claviceps*.

6. "Anatomy as a Special Department of Botany," by Dr. Emily L. Gregory.*

FRIDAY, AUGUST 19TH.

The morning meeting was called to order, and the following paper read:

7. "Observations upon Certain Species of Asclepiadaceæ as Insect Traps," by Thomas Morong.

The paper was discussed by Dr. Beal, who stated that he had found large numbers of mosquitoes caught by the flowers of *Apocynum androsæmifolium;* and by Mr. Fairchild, who called attention to the fact that the two pollen masses of the pollinia of several of our common asclepiads which, when first withdrawn from their cavities beside the stigmatic surface of the flower, are lying in one plane with edges to each other, when drying, close like the leaves of a book; he suggested this might be an adaptation to aid in bringing about its insertion into the slit of the stigmatic cavity of another flower.

Dr. Morong exhibited at this time a species of *Nymphæa*, reference to which he had previously made in the "Botanical Gazette." The species he had named *Nuphar rubrodiscum* and believed it to be a fertile hybrid of *N. Kalmianum* and *N. advena*. He referred to the publication of the species as a variety of *N. advena* in the last edition of Gray's Manual, but maintained that it is a distinct species, but if considered a variety, he suggests it is most nearly related to *N. Kalmianum*.

* To be published subsequently.

Dr. Beal offered the following resolution at this point: Resolved, that a vote of thanks of the Botanical Club be extended to E. B. Southwick, Botanist of the Central Park, New York, for his very interesting exhibit of some sixty or more species of fruits and nuts including their branches and leaves. The resolution was unanimously accepted.

The President, out of courtesy to the valuable work done by the United States Department of Agriculture, called upon Dr. Vasey to make some remarks upon the work now in progress in the Botanical Division of this Department. The Doctor outlined briefly the various undertakings of the year, mentioning first, the field work, which during the present season, has been confined to Idaho, owing to insufficient means for the support of field agents in other States as heretofore maintained. The large number of 53,000 specimens has been collected the present season and more are being sent in. In addition he mentioned the publications of the Division and announced the speedy completion of the Grasses of the Pacific Slope, a work supplementary to the Grasses of the Southwest; also the admirable work of Dr. Coulter upon the Flora of Texas, of which the third part was soon to appear. As to the experimental work in the cultivation of the forage grasses carried on at Garden City, Kansas, with branch stations in Colorado, Utah, North and South Dakota, Wyoming, Texas and New Mexico, all of which branch stations, however, have been discontinued for lack of funds; the speaker mentioned *Bromus inermis* as one of the most promising grasses, for pasture uses, of which twenty-five acres were already planted near Garden City. Dr. Vasey mentioned *Panicum virgatum*, *Andropogon nutans* and *Agropyrum glaucum* as likely to prove of value, either as pasture grasses or for meadow, and spoke hopefully of work in progress upon the growth of cereals in this arid region, expressing his opinion that cereals would be finally grown in this section of the country without irrigation.

On suggestion of Dr. Britton, who made a preliminary report of the Committee on Nomenclature, the matter of the reception of the report was made a special order for the afternoon meeting. No one objecting, the chair announced that the report of the Committee on Nomenclature would be discussed during the afternoon session.

Dr. Arthur spoke of the committee of botanists that had been appointed by the World's Fair Auxiliary to consider the matter of a Botanical Congress at the World's Columbian Exposition in 1893, stating that this committee had arranged for and caused to be printed, circular letters to be sent to all American botanists, asking their opinions in regard to the feasibility of holding such a Congress. These letters had not been distributed, for some unknown reason. In regard to the probability of the attendance of English and German botanists, if such a congress should be held, Dr. Arthur stated that from personal interviews he had ascertained that while a few German Botanists would probably attend, none, or at least very few of the English botanists would be able to come. Prof. Barnes asked for the opinion of the committee, and the Club was informed by Dr. Arthur, a member of this committee, that it was their opinion that the holding of such a Congress would not be feasible.

On motion of Prof. Barnes it was resolved:

That it is the sense of the Botanical Club of the American Association for the Advancement of Science that it is inexpedient to attempt to hold an International Congress of Botanists in connection with the World's Columbian Exposition in Chicago, in the summer of 1893.

Prof. Arthur stated that inasmuch as foreign botanists have been given the impression that there will be an International Botanical Congress at Chicago, he considered it very desirable that a special effort be made to make the next meeting of the Club and Botanical Section as interesting, important and attractive as possible, and offered the following resolution, which was unanimously adopted:

That a committee of three be appointed to act in connection with the officers of the Section of Botany, to arrange for the gathering of botanists next year, the committee to report at a later meeting.

The President appointed Prof. Arthur, Dr. Robinson and Prof. MacBride.

8. "General notes on the Cryptogamic Flora of Liberia," by O. F. Cook, was in the nature of a talk, of which the following are a few of the important points mentioned. Liberia is a tropical forest, and really no dry season occurs, for the

moisture is so great that even when the rainy season has passed the air is saturated with water. Travelling through this dense forest is made difficult by the many fallen trees which are usually covered with vines and twining plants. There are no Coniferæ to be found in the region. and only four or five species of palms, while orchids are abundant, their flowers are small and inconspicuous.

Aquatics are not numerous in the waters, and the ferns are largely epiphytic. One species is especially noticeable as apparently possessing a large prothallium in the shape of a dish which is used by the plant for the purpose of collecting water, earth, and other substances for the nutrition of the plant.

Only one species of *Adiantum* was observed, and the Hymenophyllaceous forms are few. A species resembling a *Gleichenia*, forms delicate pea green banks, very beautiful in color, while a climbing *Selaginella*, found growing upon bushes and small trees, and another upon rocks, are more beautiful than the cultivated species of that genus. One species of *Lycopodium* grows in the region to a height of 8 to 10 feet, and resembles superficially a tamarack tree.

The true mosses are scarce, with the exception of *Barbula* forms, which are frequent, and one hypnoid form found hanging from the trees, but never in fruit. Hepaticæ are present in this moist region in enormous numbers, and almost every tree-trunk is covered with a species probably of the genus *Plagiochila*. The fresh-water algæ are not numerous, a few forms like *Batrachospermum* only being found among the lower cryptogams. The Hymenomycetes are very numerous and bright-colored; one species of *Amanita* is very much larger than any ever seen before by the speaker, attaining the size of 10 inches in height by 10 inches in diameter. The Polyporei seem to be more abundant than the Agaracini, and the author is of the opinion that the present systematic arrangement of the Hymenomycetes would be of little use in this region because of the strange forms. The Gastromycetes are present only in few numbers, and parasitic fungi are extremely scarce, only one true disease, that upon the coffee plant, being noticed, and this only occasioning insignificant injury.

Lichens and Myxomycetes are not numerous, although a few strange forms were found, notable among which was a pendant species of *Comatricha*, two and one-half inches long. The species of Myxomycetes are peculiar as being represented by forms nearly related to those common in North America.

The afternoon meeting was called to order by the President pro tem, and the Committee on Botanical Nomenclature was called upon to report. Dr. Britton, chairman of the Committee, stated upon presentation of the report that it was the result of the deliberations of as large a body of botanists as could be gathered together in a preliminary meeting Tuesday evening, together with the deliberations of the committee appointed by the club, and further, that the committee was unanimously agreed upon the report. On motion, the report was adopted article by article, with slight amendments, and unanimously as a whole, as follows:

Resolved: That the Paris code of 1867 be adopted except where it conflicts with the following:

I. THE LAW OF PRIORITY.—Priority of publication is to be regarded as the fundamental principle of botanical nomenclature.

II. BEGINNING OF BOTANICAL NOMENCLATURE.—The Botanical nomenclature of both genera and species is to begin with the publication of the first edition of Linnæus "Species Plantarum," in 1753.

III. STABILITY OF SPECIFIC NAMES.—In the transfer of a species to a genus other than the one under which it was first published the original specific name is to be retained, unless it is identical with the generic name, or with a specific name previously used in that genus.

IV. HOMONYMS.—The publication of a generic name or a binomial invalidates the use of the same name for any subsequently published genus or species respectively.

V. PUBLICATION OF GENERA.*—Publication of a genus consists (1) in the distribution of a printed description of the genus named; (2) in the publication of the name of the genus and the citation of one or more previously published species as examples or types of the genus, with or without a diagnosis.

*Amended August 22nd by the insertion of the word "only" after the word "consists" in the second line.

VI. PUBLICATION OF SPECIES.*—Publication of a species consists (1) in the distribution of a printed description of the species named; (2) in the publishing of a binomial, with reference to a previously published species as a type.

VII. SIMILAR GENERIC NAMES.—Similar generic names are not to be rejected on account of slight differences, except in the spelling of the same word; for example *Apios* and *Apium* are to be retained, but of *Epidendrum* and *Epidendron*, *Asterocarpus* and *Astrocarpus*, the later is to be rejected.

VIII. CITATION OF AUTHORITIES.—In the case of a species which has been transferred from one genus to another, the original author must always be cited in parenthesis, followed by the author of the new binomial.

N. L. BRITTON, FREDERICK V. COVILLE,
JOHN M. COULTER, LUCIEN M. UNDERWOOD,
HENRY H. RUSBY, LESTER F. WARD,
WILLIAM A. KELLERMAN, *Committee.*

The principle features of the discussion were as follows:

ART. I was adopted without important discussion, the vote standing 14 to 4 in its favor.

ART. II unanimously adopted by acclamation.

ART. III adopted by acclamation, which was not unanimous. Mr. Fernow inquired in regard to the last clause, if duplicate binomials were in use among European botanists. Dr. Britton replied with the statement that to his knowledge they were not. Mr. Fernow inquired as to what specific name would be retained in case the oldest was a duplicate. Mr. Coville replied the next oldest.

ART. VI adopted unanimously.

ART. V adopted unanimously after considerable discussion. Mr. Swingle raised the question that publication of a genus without a diagnosis could not properly constitute its publication, to which Mr. Coville answered that in the "Species Plantarum," taken as the beginning of botanical nomenclature, all genera were without diagnosis, and Dr. Britton suggested that the probability of future publication of genera without diagnoses was not great.

* Amended, August 22d by the insertion of the word "only" after the word "consists" in the second line.

The article was further discussed by Messrs. Vasey, Fernow, Mohr, Bailey and Coulter, but as much of this referred to article I and not to V it is not repeated here.

ART. VI adopted unanimously after a protracted discussion, in which distinct differences of opinion were expressed. Mr. W. T. Swingle objected to the exclusion of specimens distributed in exsiccati or collections from consideration as published species, even if without dignoses, and offered the amendment as a 3d section to be added to this article: "(3) in the distribution of specimens with ink or printed labels to the principal herbaria or specialists." The amendment was lost, the vote standing 12 to 4 against its adoption. Mr. O. F. Cook also offered the following amendment: "that all species described before Jan. 1st, 1893, under herbarium and manuscript names shall stand, but not after that date." This amendment was lost.

ART. VII adopted unanimously.

ART. VIII adopted unanimously.

Dr. Britton presented the following resolutions, which were unanimously adopted:

Resolved: That the Committee on Nomenclature be continued as a permanent Committee of the Club or Botanical Section of the A. A. A. S. to prepare and print a list of flowering plants within the area of the 6th edition of Gray's Manual, in accordance with these recommendations.

(Amended Aug. 22d, increasing the area by including the States of Kansas and Nebraska, and the Canadian Provinces from Manitoba to Newfoundland.)

Resolved: That this Committee be empowered to receive all suggestions and criticisms of this list, and to report upon the matter at the next meeting of the Club or Botanical Section.

MONDAY, AUGUST 22D.

The meeting was called to order by the Secretary, who called Mr. H. L. Russell to the chair, in the absence of President and Vice-President.

The Committee on Nominations reported, naming the following members as officers for the ensuing year: President, W. P. Wilson;

Vice-President, W. A. Kellerman; Secretary, T. H. MacBride. They were unanimously elected.

The following papers were presented:

9. "On the proposed Hand-book of Mosses of Eastern America," by Mrs. E. G. Britton. Discussed by Messrs. Barnes, Jones and Claypole.

10. "Weeds and Weed Roots," by B. D. Halsted. A simple method of photographing herbarium specimens from above, consisting of a framework to support the camera at a distance of 15 to 25 feet above the specimens laid out upon a large table. With illustrative photographs.

11. "The re-discovery of *Juncus Cooperi*," by F. V. Coville.*

12. "The North American *Amelanchiers*," by N. L. Britton.*

13. "A new form of Root Cage," by J. C. Arthur. The author exhibited a new form of root cage for use in the study of the growth of roots, consisting of two plates of glass separated by thin strips of the same material and held in place by zinc clamps, the whole to be placed in a shallow trough, filled with water. The advantages of the cage with easily removable glass sides was dwelt upon.

14. "The Botanical Garden movement in New York," by N. L. Britton.

15. "A few additions to the Hepatic flora of the Manual Region,"* by L. M. Underwood.

Discussed by Mr. Coville, who mentioned the finding of a *Fossombronia* in the neighborhood of Cayuga Lake, which he believed was referable to *F. cristata*.

The following resolutions were presented and adopted:

"That Dr. Lucien M. Underwood be delegated to represent this Association of American Botanists at the International Botanical Congress to be held at Genoa, Italy, Sept. 4 to 11, 1892."

"That a committe, of three be appointed to obtain funds by subscription to defray the expenses of the delegate."

The Chairman appointed Dr. J. M. Coulter, Dr. W. P. Wilson and Dr. E. F. Smith.

The afternoon meeting was called to order by the Vice-President pro tem., and the Committee on Arrangements for the

*To be printed in full later.

meeting of botanists in connection with the Association next year, appointed Friday morning, reported the following recommendations, which were adopted:

I. (1). That the officers (vice-president and secretary) of the section of botany for 1893 shall, together with one person to be chosen by the Botanical Club, constitute a committee to whom is referred the arrangement of a special programme for the meeting of 1893.

(2). That the programme shall include, among other matters, certain special topics selected by the committee.

(3). That each topic shall be introduced by a paper presented by some person to whom the topic has, with his consent, been assigned.

(4). That upon completion of the preliminary programme and other arrangements, a printed statement, with an invitation to be present at the meeting, be sent to both American and foreign botanists.

II. That a committee of three, of which Dr. N. L. Britton shall be chairman, be appointed to make such arrangements for special excursions at the close of the meeting, as may be found practicable and desirable.

In accordance with the recommendations of the report, the President appointed the following committees:

1. The Committee of Arrangements.—Dr. Bessey, Mr. Coville and Prof. Barnes.

2. The Committee on Excursions.—Dr. Britton, Dr. Trelease and Dr. Campbell.

The matter of the organization of a permanent American Botanical Society was brought up by Professor Bailey, and the following resolution offered and adopted:

"That a committee of nine members be appointed by the Chairman to consider the formation of an American Botanical Society after obtaining the views of the botanists of America on the proposition, and report thereon at the next meeting of the Club."

The Chairman appointed as this committee: L. H. Bailey, Chairman, W. G. Farlow, Emily L. Gregory, B. D. Halsted, James Fletcher, Douglass H. Campbell, C. R. Barnes, F. Lamson-Scribner, Lester F. Ward. On motion of Dr. Britton, Dr. W. P. Wilson's name was added.

The following papers were read:

16. "On the Genus *Campylopus* in North America," by Mrs. E. G. Britton.*

17. "Note on a Recent Outbreak of Peach Yellows near Ann Arbor, Mich.," by A. A. Crozier. The speaker adduced evidence to prove the communicability of the disease.

18. "Some observations on *Epigæa repens*, by W. P. Wilson.*

19. "Notes on Some Species of *Cratægus*," by N. L. Britton.*

Dr. Arthur exhibited leaves of *Drosera rotundifolia*, brought by Miss Edna Porter, of Buffalo, from which young plants were growing.

TUESDAY, AUGUST, 23D.

The meeting was called to order by the Vice-President pro tem. at 1:30 P.M., and after the appointment of the Committees on Arrangements for the ensuing year, on excursions for the next meeting and on the establishment of an American Botanical Society, (the names appearing in their proper places below the resolutions as adopted), the club listened to the following papers:

"Observations on the ripening of the seeds of *Cuphea*," by Mrs. H. L. T. Wolcott.

The paper called attention to a novel adaptation in a cultivated species of *Cuphea*, by which the placenta with immature ovules pushes through the side of the calyx tube and stands exposed as a curved projection for the purpose of ripening its seeds, which fall to the ground on maturity. The author also wished to make a report upon her work, in connection with the Department of Agriculture, which she had been requested to make by Dr. J. N. Rose, and which consisted of tests of large numbers of seeds of rare plants from Mexico and other regions. Although the work has just been begun, there have been secured a large number of rare *Ipomœæ*, now growing in pots.

The paper was discussed by Dr. Britton, who stated that *Cuphea viscosissima* had a habit similar to that called attention to, by Mrs. Wolcott.

20. "Notes on the Moutain Flora of Northern Alabama," by Chas. Mohr.†

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* To be published later.

† To be printed in full in an early number of "Garden and Forest."

Mr. Fernow, as chairman of the committee on a discussion of what data should accompany herbarium specimens, reported a complete disagreement of opinion in the committee, and on motion this committee, consisting of Messrs. Fernow, Coville and Beal, was continued to report at the next meeting. Owing to the desire of many members to take advantage of the excursion to the fish hatchery at Mumford, the club adjourned at 2 P.M. to meet in 1893 at Madison, Wisconsin. The following papers were read by title only, either because of absence of their authors or for lack of time.

"Some general questions in the classification of Myxomycetes," by O. F. Cook.

"North American Cacti," by J. M. Coulter.

"Cultivated species of *Brassica*." by L. H. Bailey.

"Notes on the distribution of plants in Florida," by P. H. Rolfs.

"Notes on some fungi common during the season of 1892 at Ames, Iowa," by L. H. Pammel.

"Notes on some Kansas weeds," by A. S. Hitchcock.

"Notes on the flora of Block Island," by W. W. Bailey.

"Notes on the distribution of a few plants," by L. H. Pammel.

"Phænological notes for 1892," by L. H. Pammel.

"Observations on the North American species of Orchidaceæ and their nomenclature," by Thomas Morong.

"Some noteworthy features of the flora of West Virginia," by C. F. Millspaugh.

"On the genus *Ditrichum* in North America with one new Western species and corrections for two Eastern species," by Mrs. E. G. Britton.

"Notes on terminology," by Theo. Holm.

"Notes upon a revision of the North American Naiadaceæ," by Thomas Morong.

"Notes on some pear and apple diseases," by M. B. Waite.

"Modifications of the tomato plant resulting from seed selection," by E. S. Goff.

"Some of the rare Mosses of White Top and vicinity, recently collected on a trip to Southwestern Virginia," by Mrs. E. G. Britton.

"Galvanotropism," by J. C. Arthur.

"A botanical terminology," by A. A. Crozier.

"A proposed collection of mosses of New York State for the Columbian Exposition," by Mrs. E. G. Britton.

"Climing habit of *Tillandsia usneoides*," by W. P. Wilson.

D. G. FAIRCHILD, *Secretary.*

TITLES OF BOTANICAL PAPERS READ OR PRESENTED BY TITLE BEFORE THE SECTION OF BIOLOGY, A. A. A. S., ROCHESTER MEETING, AUGUST, 1892.

Notes on *Ranunculus repens* and its Eastern North American allies, by N. L. Britton.

Notes on a monograph of the North American species of *Lespedeza*, by N. L. Britton.

The root system of *Mikania scandens*, by W. W. Rowlee.

Preliminary comparison of the Hepatic Flora of boreal and sub-boreal regions, by L. M. Underwood.

Notes on Maize, by G. Macloskie.

Spikes of Wheat bearing abnormal spikelets, by W. J. Beal.

A study of the relative lengths of the sheaths and internodes of grasses for the purpose of determining to what extent this is a reliable specific character, by W. J. Beal.

Adaptation of seeds to facilitate germination, by W. W. Rowlee.

Bacteriological investigations of marine waters and the sea floor, by H. L. Russell.

Sketch of the Flora of Death Valley, California, by F. V. Coville.

How the application of hot water to seed increases the yield, by J. C. Arthur.

Heredity of acquired characters, by M. Miles.

On the supposed correlation of quality in fruits—a study in evolution, by L. H. Bailey.

Non-parasitic Bacteria in Vegtable Tissue, by H. L. Russell.

Notes on Yellow Pitch-pine—*Pinus rigida*, Mill. var. *lutea*, Kell. n. v., by W. A. Kellerman.

Germination at Intervals of Seeds Treated with Fungicides, by W. A. Kellerman.

The Fertilization of Pear Flowers, by M. B. Waite.

The Fertilization of the Fig and Caprification, by C. V. Riley.

A Comparative Study of the Roots of Ranunculaceæ, by F. B. Maxwell (presented by W. R. Dudley.)

The conditions which determine the distribution of bacteria in the water of rivers, by J. H. Stoller.

Notes on *Daucus Carota*, by C. W. Hargitt.

Geographic relationship of the flora of the high Sierra-Nevada, California, by F. V. Coville.

Variation in native ferns, by W. M. Beauchamp.

Life-for-ever eradicated by a fungous disease, by D. G. Fairchild.

Otto Kuntze's changes in nomenclature of North American grasses, by G. Vasey.

Revised nomenclature of the arborescent flora of the United States, by B. E. Fernow and G. B. Sudworth.

Characteristics and adaptations of desert vegetation, by F. V. Coville.

Shrinkage of woods as observed under the microscope, by F. Roth.

Peziza sclerotium, by L. H. Pammel.

Temperature and some of its relations to plant life, by L. H. Pammel.

Pleospora of *Tropæolum majus*, by B. D. Halsted.

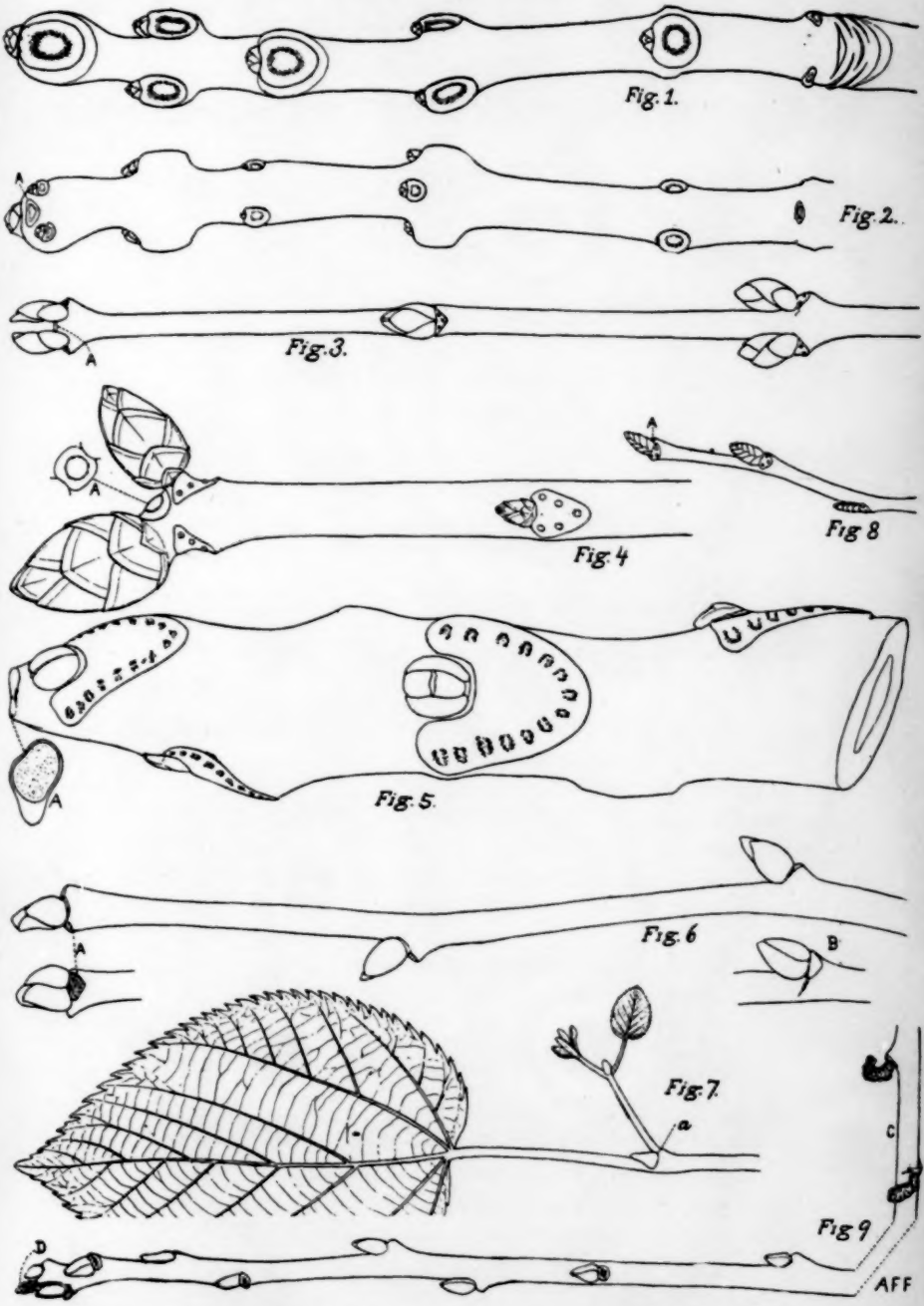
Secondary spores of *Anthracnoses*, by B. D. Halsted.

A Bacterium of *Phaseolus*, by B. D. Halsted.

The significance of Cleiostogamy, by T. Meehan.

During the meeting it was decided to divide the Section of Biology into two sections, one of Zoology and one of Botany.

The next meeting of the Association will be held at Madison, Wis., and the officers elected for the Section of Botany are, Vice-President: C. E. Bessey, University of Nebraska; Secretary: F. V. Coville, Dept. of Agriculture, Washington, D. C.



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